

### **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

#### **Listing of Claims:**

Claim 1 (Currently Amended): A diagnostic system for a field device in a process control apparatus, comprising:

at least one sensor associated with the process control apparatus;

a computer located on the field device and adapted to receive data from the sensor over predetermined intervals of time, [[and ]]to detect an occurrence of a predetermined process event and to overwrite previously received sensor data if the occurrence of the predetermined process event is not detected once the predetermined interval of time has elapsed; and

a memory device operatively connected to the computer and adapted to store sensor data received by the computer if the occurrence of the predetermined process event is detected, wherein at least one of the computer or the memory device is further adapted to store sensor data collected over the interval of time coinciding with the occurrence of the predetermined process event and at times prior to the detected occurrence of the predetermined process event.

Claim 2 (Cancelled).

Claim 3 (Original): The diagnostic system of claim 1, wherein the memory device is further adapted to store sensor data received by the computer at times subsequent to the occurrence of the predetermined process event.

Claim 4 (Cancelled).

Claim 5 (Original): The diagnostic system of claim 1, wherein the computer is a microcontroller located on the field device.

Claim 6 (Original): The diagnostic system of claim 1, wherein the memory device is located on the field device.

Claim 7 (Original): The diagnostic system of claim 6, wherein the memory device is a non-volatile RAM.

Claim 8 (Original): The diagnostic system of claim 1, wherein the field device is a valve positioner.

Claim 9 (Original): The diagnostic system of claim 1, wherein the predetermined process event is an excessive travel deviation of a valve element.

Claim 10 (Original): The diagnostic system of claim 1, wherein the predetermined process event is a sensor signal, representing a sensed valve parameter, crossing a cutoff point.

Claim 11 (Currently Amended): A method of monitoring the performance of a process control system including at least a first field device, comprising:

- providing at least one sensor associated with the first field device;
- providing a memory device operably coupled to the first field device;
- collecting data from the sensor over predetermined intervals of time;
- detecting the occurrence of a predetermined process event;
- overwriting previously received sensor data if the occurrence of the predetermined process event is not detected once the predetermined interval of time has elapsed; and
- storing data on the memory device from the sensor collected over the interval of time coinciding with the occurrence of the predetermined process event and at a time prior to the occurrence of the predetermined process event if the occurrence of the predetermined process event is detected.

Claim 12 (Cancelled).

Claim 13 (Original): The method of claim 11, further including storing data from the sensor collected at times subsequent to the occurrence of the predetermined process event.

Claim 14 (Previously Presented): The method of claim 11, wherein the first field device detects the occurrence of the predetermined process event and communicates the occurrence of the predetermined process event to at least a second field device to store data on a second memory device associated with the second field device.

Claim 15 (Original): The method of claim 11, wherein the predetermined process event is an excessive travel deviation of a valve element.

Claim 16 (Original): The method of claim 11, wherein the predetermined process event is a sensor signal, representing a sensed valve parameter, crossing a cutoff point.

Claim 17 (Currently Amended): A field device for a process control apparatus, comprising:

at least one sensor;

a computer located on the field device and adapted to receive data from the sensor over predetermined intervals of time, [[and ]]to detect an occurrence of a predetermined process event and to overwrite previously received sensor data if the occurrence of the predetermined process event is not detected once the predetermined interval of time has elapsed; and

a memory device operatively connected to the computer and adapted to store sensor data received by the computer at a time corresponding to the occurrence of the predetermined process event if the occurrence of the predetermined process event is detected, wherein at least one of the computer or the memory device is further adapted to store sensor data collected over the interval of time coinciding with the occurrence of the predetermined process event and at times prior to the detected occurrence of the predetermined process event.

Claim 18 (Original): The field device of claim 17, wherein the predetermined process event is the occurrence of a sensed parameter being out of a predetermined range.

Claim 19 (Original): The field device of claim 17, wherein the predetermined process event is the failure of a sensor.

Claim 20 (Original): The field device of claim 17, wherein the predetermined process event is a component failure.

Claim 21 (Original): The field device of claim 17, wherein the predetermined process event is a process variable change.

Claim 22 (Original): The field device of claim 17, wherein the predetermined process event is a command from a process control workstation.

Claim 23 (Cancelled).